Coupling WXXM Development with Aviation Forecast Operations

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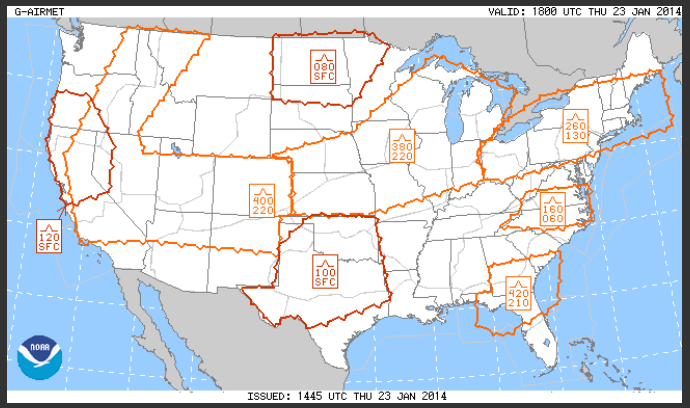
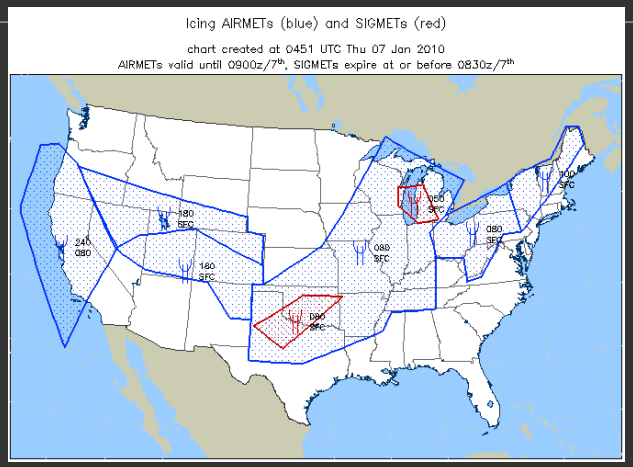
Aviation Weather Center

- 42 Operational Forecasters
  - 25 Domestic Branch
  - 13 International Branch
  - 4 National Aviation Meteorologists (ATCSCC)
- 19 Support Branch
  - 10 Development Meteorologists
  - 9 IT Staff
- 10 Management & Admin Staff

AWC Products






```
CHIC FA 231101 AMD
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 240500
CLDS/WX VALID UNTIL 232300...OTLK VALID 232300-240500
.
KS
NW...OVC080 TOP FL240. -SN. 18Z SKC. OTLK...VFR.
SW...OVC080 TOP FL240. VIS 3-5SM -SN BR. 21Z SKC. OTLK...VFR.
N CNTRL-NERN...BKN CI. 14Z SKC. OTLK...VFR.
RMNDR...BKN100 TOP FL260. 18Z BKN CI. 20Z SCT CI. OTLK...VFR.
.
MO
N HLF...SKC. 12Z SCT CI. OTLK...VFR.
SW...SCT040 BKN CI. WND NW G25KT. BECMG 1618 SCT CI. OTLK...VFR.
SE...SCT040 BKN CI. WND N G25KT. 21Z SCT040 SCT CI. OTLK...VFR.
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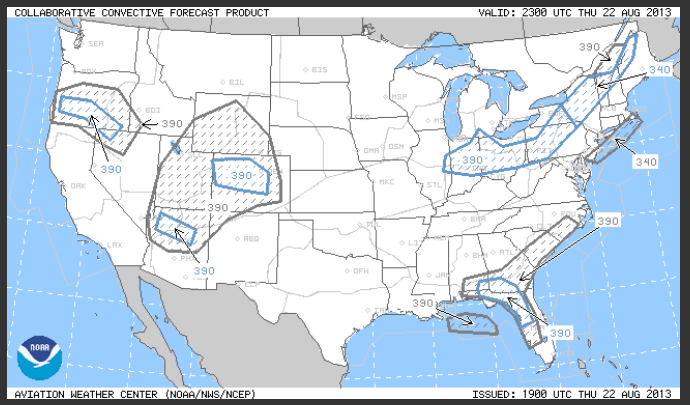
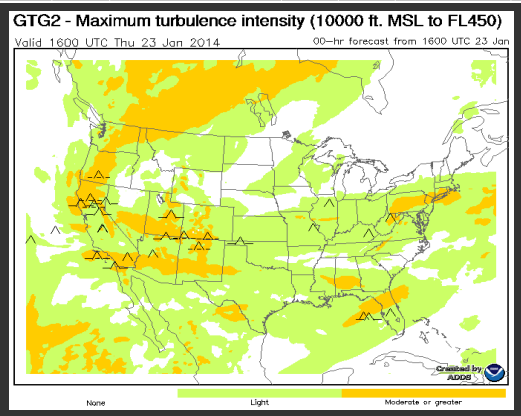
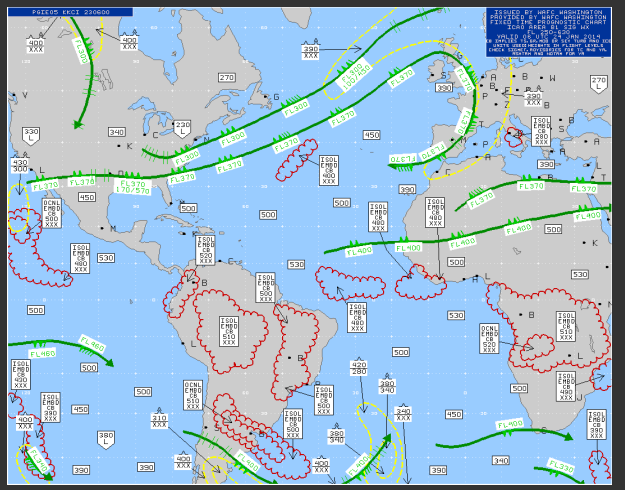
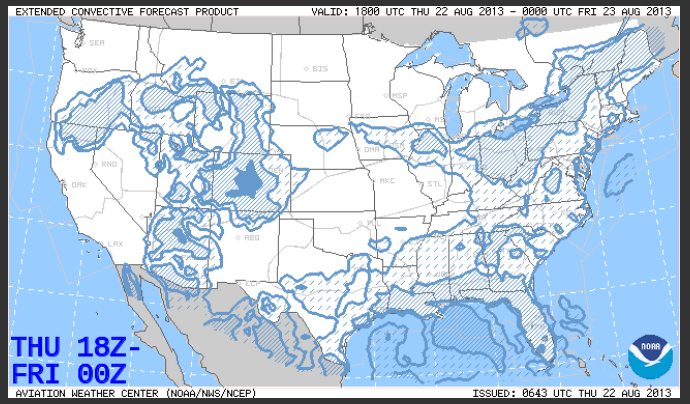
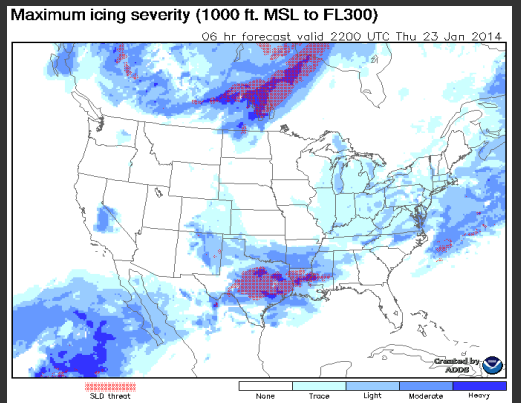
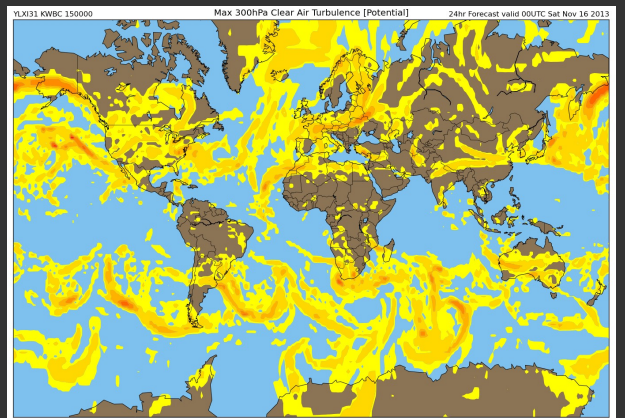












Challenge: Production Process

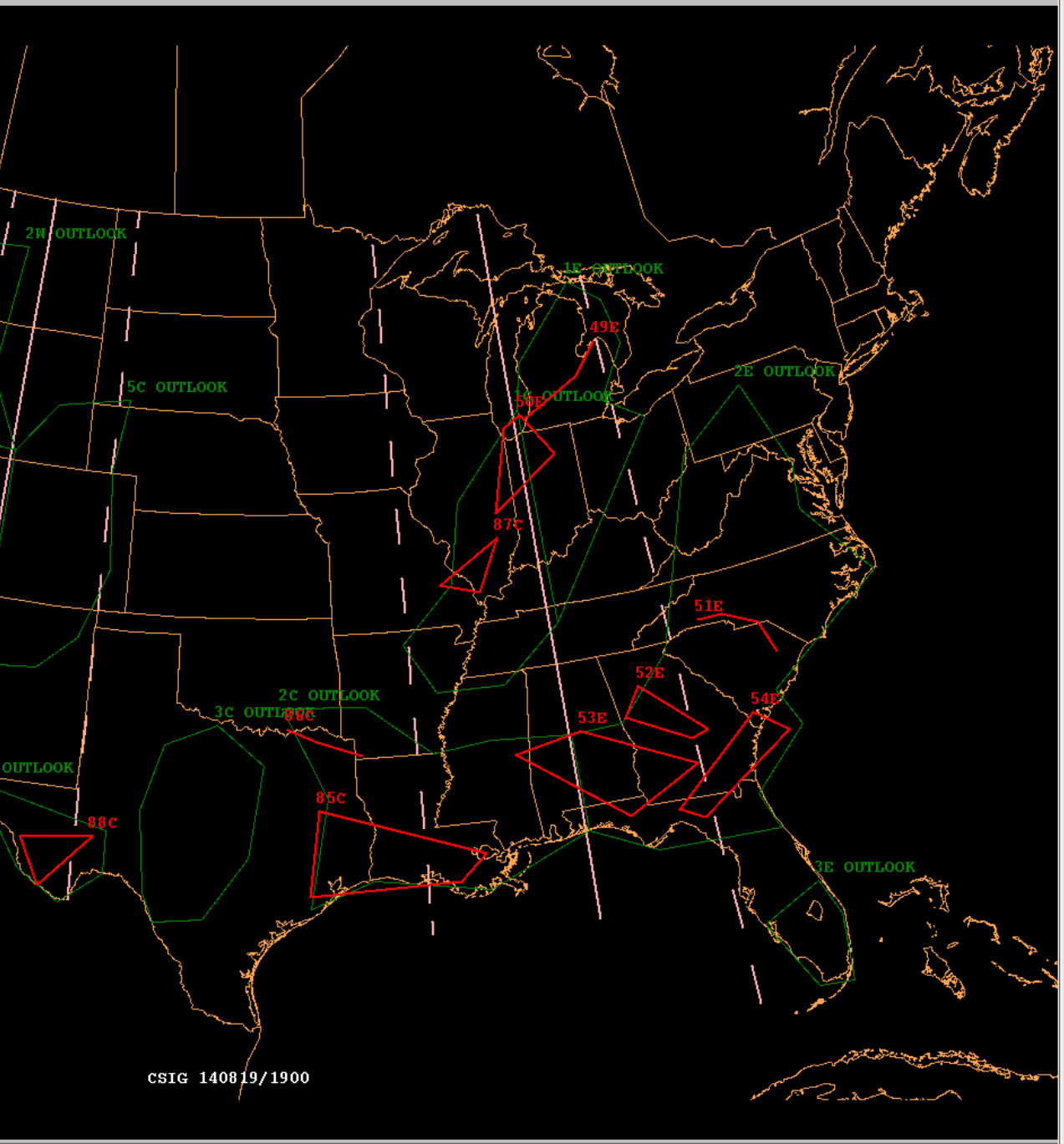
- Current AWC products have varying levels of manual (text) modification
  - Increased chance for human formatting error
  - Some forecasters love flexibility of text
- Currently WXXM products are generated by decoding official ASCII or BUFR format
  - Generation will occur within production software
  - Both Legacy and WXXM created in parallel
  - Production will need to be less manual

NMAP2 (Version 7.1.0)

Help

Loop: 1

Zoom | Unzoom | Hide Loop | Stop



Product Generation Inactive | Fade: | ERROR

sig.wrk - /awc/fcst/sigmet/wpfiles/ ID=0

File Edit Preferences Tools Windows

A2I A2L I2A I2L L2A L2I SDM CEM SvSDM SvCEM UPDT_Spl RtSentSIG

A2L L2A Build Sev Otlk RtWork RtSig SaveSIG SaveWork Update SIGCheck

Stat Info

```
ZCZC MKCSIGE ALL 191855
WSUS31 KKCI 191855
\x1eMKCE WST 191855
CONVECTIVE SIGMET 49E
VALID UNTIL 2055Z
MI LH LM
FROM 30SSE ASP-20WNW FNT-30SW PMM
LINE SEV TS 35 NM WIDE MOV FROM 27030KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 60KT POSS.

CONVECTIVE SIGMET 50E
VALID UNTIL 2055Z
MI IN IL LM
FROM 30WSW PMM-20W FWA-30ESE AXC-20E ORD-30WSW PMM
AREA SEV TS MOV FROM 27030KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 60KT POSS.

CONVECTIVE SIGMET 51E
VALID UNTIL 2055Z
NC SC
FROM 20N SPA-10NW CLT-40NNW FLO-20S FLO
LINE TS 30 NM WIDE MOV FROM 28020KT. TOPS TO FL410.

CONVECTIVE SIGMET 52E
VALID UNTIL 2055Z
GA
FROM 20N ATL-50N AMG-40SE MCN-10NE LGC-20N ATL
AREA TS MOV FROM 27035KT. TOPS TO FL420.

CONVECTIVE SIGMET 53E
VALID UNTIL 2055Z
FL GA AL MS
FROM 40SSE VUZ-30W AMG-60W TLH-20N MEI-40SSE VUZ
AREA SEV TS MOV FROM 29025KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

CONVECTIVE SIGMET 54E
VALID UNTIL 2055Z
SC FL GA AND SC GA CSTL WTRS
FROM 20NNE SAV-60ESE SAV-30NNW CTY-20ESE TLH-20NNE SAV
AREA SEV TS MOV FROM 27025KT. TOPS ABV FL450.
HAIL TO 1 IN...WIND GUSTS TO 50KT POSS.

OUTLOOK VALID 192055-200055
AREA 1...FROM 40SE SSM-60NE ASP-40NE ECK-DXO-CLE-BNA-30W
PMM-40NNW MKG-40SE SSM
REF WW 467.
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM
PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

AREA 2...FROM SLT-DCA-RIC-70SSE ECG-CHS-70SSE CHS-CRG-OMN-70SSW
TLH-30SSW CEW-40S VUZ-LGC-ODF-AIR-SLT
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM
```

CHECK/DISPLAY SIGMETS

Modifications to Production

- WXXM production from forecast tools
  - Leverage New format to affect change
  - Update production tools for better efficiency
- Migration from N-AWIPS to AWIPS2
  - Initially need to have similar tools
  - Potential for new tools on a new platform
  - AWIPS2 already database and XML heavy

External Motivations

Currently Evolving Products

- Text Area Forecast (FA)
  - Slated for possible elimination
  - More time to provide services GA
- Aviation Weather Statement
  - FAA Statement of Need to NWS
  - Result of CDM process
  - Automation of the CCFP

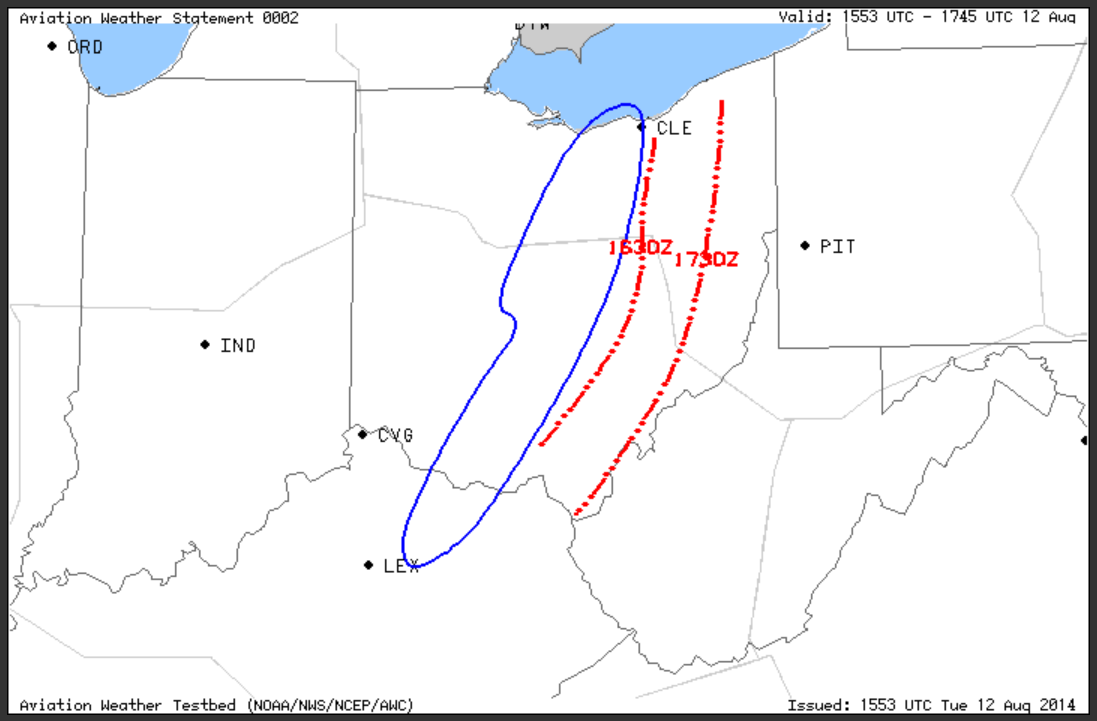
Forecast Operations Evolution

- Current AWC domestic hazards operation divided by forecast area (East/West/Central)
- Primary reason for division was FA
  - Text-based forecast covers multiple hazards

Forecast Operations Evolution

- Division of forecast responsibilities
  - FA meant responsibilities split geographically
  - Without FA, division could be hazard-based
- FA Production Time
  - Currently FA takes 3-4 hours to write
  - More time to provide better forecast services
  - Could spend this time on highlighting areas of enhanced risk for aviation hazards

Aviation Weather Statement



Aviation Weather Statement 0002
NWS Aviation Weather Center Kansas City MO
1553 UTC Tue 12 Aug 2014
Valid Period...1553 UTC - 1745 UTC 12 Aug

AWS for Convection...

NAS Elements Affected...
ARTCCs...ZID ZOB
TRACONs...
Terminals...

Constraints...CURENT LINE SCT TS CTRL OH PROJECTED TO MOVE EAST OVER NEXT 2 HOURS AND BECOME BROKEN LINE TS BY 1630Z. TS TOPS FL500 WILL INCREASE TO FL550 BY 1630Z. BKN LINE WILL CONTINUE TO EAST INTO WESTERN PA/WESTERN MD/N WV AFT 1830Z.JET ROUTES IMPACTED INCLUDE:
J80
J64
J60
J149
J85

Aviation Weather Statement

- Event-driven product for short-term hazards
- Outlined in FAA Statement of Need
  - Collaborative between AWC, CWSU, & WFO
  - Targeted for Traffic Flow Management ops
- Product designed for decision support
  - NAM and NOM interaction
    - NWS National Aviation Meteorologist
    - FAA National Operations Manager

Challenge: Product Ownership

- AWC planning to be responsible for creation of WXXM for AWC products
- How will other products be transitioned?
  - Simple answer is decode and convert to XML
  - Aim for product owner creation of WXXM
  - Could be a challenge for products that are not aviation specific

Flexibility in WXXM

- Timing and position is unique opportunity
  - Update to forecast dissemination formats
  - Evolution of forecast products and operations
- Considerations for developing WXXM
  - Schemas must describe current formats
  - But need to provide flexibility
  - Strong v. Weak typing

SIGWX: Flexibility Example

- High & Mid-Level Significant Weather
  - Defined in ICAO Annex 3
  - Jets, turbulence, convection, and icing
- Low-Level Significant Weather
  - US Domestic product
  - Turbulence, freezing levels, flight categories
- Needs to describe all aspects of product defined and required by ICAO
- Also should be generally adaptable for other significant weather depictions
- Schema doesn't need to lock down business rules

WXXM for new products

- First product will likely be AWS
  - Free-form discussion presents challenges
  - Other aspects can be standardized
  - Strong argument for weak typing
  - Would likely still have
- Natively transmit WXXM

Challenge: WXXM-only Product

- Dissemination path not fully defined
  - Web services are optimal landing pad
  - Many users still rely on NOAAport
  - Need for a WMO Header for non-web services
- Ingest into NWS software
  - Will no longer need text decoders
  - But need to map documents to database

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